

REMARKS/ARGUMENTS

I. Introduction:

Claims 1, 3, 5, 6, 7, 8, 10, 12, 14, 15, 17, 21, 22, and 25 are amended and claims 27-29 are added herein. With entry of this amendment, claims 1, 3-8, 10-15, 17, 18, 21, 22, and 24-29 will be pending.

The courteous telephone interview granted applicant's undersigned attorney by Examiner Gregory Sefcheck on January 9, 2006 is hereby respectfully acknowledged. The claims are amended herein as discussed in the interview and the arguments discussed in the interview are set forth below.

II. Claim Rejections – 35 U.S.C. § 112:

Claims 3, 10, and 17 have been amended to include antecedent basis for "said time slots" and claim 6 has been amended to replace "said selected node" with "said submaster node". As amended, claims 3, 6, 10, and 17 are believed to meet the requirements of 35 U.S.C. 112.

III. Claim Rejections - 35 U.S.C. § 102

Claims 5 and 6 stand rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,785,510 (Larsen).

Larsen discloses a method for routing in a multi-station network. Data is relayed between mobile stations by making synchronization transmissions from each base station within an area of coverage of the base stations. The synchronization transmissions are received at the mobile stations and data defining a channel on which mobile stations can

transmit probe data to one another is extracted therefrom. The probe data is used by the mobile stations to obtain connectivity information relating to the availability of other mobile stations.

Claim 5 has been amended to clarify that said slave nodes, submaster node, and master node define three levels of a transmission control hierarchy and that the time allocation is scheduled such that only a single node in the transmission control hierarchy is allowed to transmit at a time.

Larsen does not disclose a transmission control hierarchy as set forth in claim 5. Accordingly, claims 5 and 6 are submitted as not anticipated by Larsen.

IV. Claim Rejections - 35 U.S.C. § 103

Claims 1, 3, 4, 7, 8, 10, 11, 14, 15, 17, 18, 21, 22, 25, and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. US 2004/0028071 (Gehring et al.) in view of Larsen, and further in view of U.S. Patent Application Publication No. US 2002/0072329 (Bandeira et al.).

Claim 1 is directed to a method for coordinating access to a shared transmission medium. The method generally comprises, inter alia, recording at a master node a contact path from the master node to a new slave node, generating a schedule of wireless transmission for nodes of the wireless communication network, and distributing the schedule from the master node to nodes controlled by the master node. The schedule precludes collisions between simultaneous transmission by any pair of nodes controlled by the master node including pairs of nodes that do not hear each other's transmissions. The wireless communications network is made up of a master node, a plurality of slave nodes, and at least one submaster node. Each of the slave nodes and the submaster node are controlled by the master node. The new slave node is able to communicate directly with the submaster node and is out of range of the master node. Claim 1 has been

amended to clarify that the schedule generated at the master node includes transmission for at least two levels of hierarchy comprising the submaster node and the slave nodes.

Gehring et al. is directed to an apparatus and method for managing variable-sized data slots with timestamp counters within a TDMA frame. As shown in Fig. 1 the network system includes a master transceiver device 12 and one or more slave transceiver devices 14a-14n. All slave devices hear each other's transmissions. As noted by the Examiner, Gehring et al. do not disclose a transmission schedule that precludes collisions between simultaneous transmission by any pair of nodes that do not hear each other's transmissions.

It is respectfully submitted that neither Larsen nor Bandeira overcome the deficiencies of Gehring et al. Bandeira et al. disclose a scalable wireless network topology system. As shown in Fig. 2, the system includes a root node 1, node 2, which serves as a repeater for locations 5 and 9, and various other nodes. Node 2 is a parent node to children nodes 5 and 9. The parent transceiver (e.g., node 2) works as a master and all of its one-hop children transceivers work as slaves (see, for example, paragraph 0051 of Bandeira et al.). Paragraph 0086 describes how a slave node first performs a slave cycle and then performs a master cycle to provide service for its own children.

Bandeira et al. specifically address methods for avoiding collisions within a branch (defined as a parent transceiver together with its one-hop children). See for example, paragraph 0045, which describes operating in two distinct frequencies for inbound and outbound transmissions or paragraph 0048, which describes power management techniques. In fact, the power management techniques are described specifically for avoiding collisions between simultaneous transmissions from two nodes (see, paragraph 0048 lines 3-7). As noted at paragraph 0046, different branches may have simultaneous transmissions. Thus, the system is configured to avoid collisions within a branch and not between simultaneous transmission by any pair of nodes controlled by a master node including pairs of nodes that do not hear each other's transmissions.

Furthermore, since a slave node of Bandeira et al. can operate as a master node to control its children (slave nodes) separate from the root node, not all slave nodes are controlled by the original master node.

The polling scheme shown in Fig. 4 and described at paragraphs 0059 and 0060 of Bandeira et al. is simply a consecutive polling scheme that goes from one child node to the next child node. The root node has no knowledge and makes no modifications for children nodes of a parent node (that is the root's node child node). There is nothing to prevent to separate branches from performing polling cycles at the same time. In fact, a repeater mode may not respond to a parent node because it is busy performing its own polling cycle. The root or parent node is only concerned with its children nodes and do not generate a schedule or allocate time slots for itself or any other nodes. Thus, there is no schedule generated at a master node which precludes collisions between simultaneous transmission by any pair of nodes controlled by the master node including pairs of nodes that do not hear each other's transmissions, as required by claim 1. Furthermore, Bandeira does not generate a transmission schedule for at least two levels of hierarchy.

Applicant's invention, as set forth in the claims, is particularly advantageous in that it allows for automatic reconfiguration of the network upon admission of a new node, with the reconfigured network continuing to operate so as to avoid collisions, even between nodes that cannot hear one another. Moreover, since the master node has control of all the nodes beneath it in the network control hierarchy and only one node transmits at a time, no two nodes transmit simultaneously even if they cannot hear one another. There is, therefore, no need for the nodes to transmit and receive on different frequencies.

Accordingly, claim 1 is submitted as patentable over Gehring et al., Larsen, and Bandeira et al.

Claims 3, 4, and 26-28, depending from claim 1, are submitted as patentable for at least the same reasons as claim 1.

Claims 8, 15, and 22, and the claims depending therefrom, are submitted as patentable for the reasons set forth above with respect to claim 1.

Claim 7 specifies that the transmission schedule generated at the master node is divided into a plurality of time slots and that each of the slave nodes within communication range of the master node has at least one of the of time slots allocated thereto for transmission from the slave node to the master node. At least one of the time slots is allocated for the submaster node and the slave node that is out of range of the master node and able to communicate directly with the submaster node. Claim 7 has been amended to clarify that the schedule generated at the master node includes transmission for at least two levels of hierarchy.

As previously discussed, Bandeira et al. do not show or suggest a time slot allocated for both a submaster node and a slave node which is able to contact the submaster node but not within range of the master node. Applicant's invention generates a schedule at the master node that divides transmission time for the master node as well as times allocated to each of the slave nodes. The transmission time slot reserved for a submaster node includes extra time for the slave node that is out of range with the master node. In contrast, the root node of Bandeira et al. simply use a consecutive polling scheme with no knowledge of which nodes or how many nodes it is receiving transmissions from during a polling cycle.

Accordingly, claim 7 is submitted as patentable over the prior art of record.

Claims 14 and 21 are submitted as patentable for the reasons discussed above with respect to claim 7.

Claims 12 and 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Larsen.

Claim 12 has been amended to clarify that the slave nodes, submaster node, and master node define three levels of a transmission control hierarchy and that the time allocation is scheduled such that only a single node in the transmission control hierarchy is allowed to transmit at a time. Claims 12 and 13 are submitted as patentable for the reasons discussed above with respect to claim 5.

Claim 24 stands rejected under 35 U.S.C. 103(a) as being patentable over Larsen in view of U.S. Patent No. 5,708,655 (Toth). Applicant respectfully submits that Toth does not overcome the deficiencies of Larsen discussed above. Claim 24 is submitted as patentable for at least the same reasons set forth above with respect to claim 5.

V. Conclusion:

For the foregoing reasons, Applicant believes that all of the pending claims are in condition for allowance and should be passed to issue. If the Examiner feels that a telephone conference would in any way expedite prosecution of the application, please do not hesitate to call the undersigned at (408) 399-5608.

Respectfully submitted,



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